

Bad boot volume

HDSETUP error: See "No boot volume found."

BAD BOOTCOPY COMMAND

BOOTCOPY error: The BOOTCOPY command was incorrectly typed. Re-enter the command.

Bad command or file name

MS-DOS error: You typed an incorrect command or file name. Retype the command or file name correctly.

Bad DCOPY command

DCOPY error: The command was typed incorrectly. Retype the command.

BAD Directory on d: Space Allocation Conflict:

User n d:filename.typ

STAT has detected a space allocation conflict in which one data block is assigned to more than one file. One or more file names might be listed. Each of the files listed contains a data block already allocated to another file on the disk. You can correct the problem by erasing the files listed. After erasing the conflicting file or files, press ALT-C to regenerate the allocation vector. If you do not, the error may reoccur.

Bad Drive Number: press any key to continue.

DCOPY or FORMAT error: An incorrect drive name was typed.

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Bad FORMAT command

FORMAT error: The command was typed incorrectly. Retype the command.

BAD MEDIA. PRESS RETURN KEY TO START OVER OR ALT-C TO EXIT.

SDCOPY error: Utility encountered a bad sector while reading or writing a diskette. User should replace diskette.

Bad volume name

HDSETUP error: Specify a new volume name. List the volumes to check that you have the right name and redo the operation that caused the error.

Bdos Err on X: R/O

CP/M-86 error: Type an ALT-C to terminate the program you were using. At the OS command prompt, type another ALT-C to clear the disk system.

If your diskette is write-protected, retry with a diskette that is not write-protected. If the error persists, try again with another diskette.

The drive has been assigned read-only status with a STAT command, or the disk in the drive has been changed without resetting the disk system with an ALT-C. CP/M-86 terminates the current program as soon as you press any key.

Bdos err on X: bad sector

This can indicate a hardware problem, or a worn, improperly formatted or missing disk. Enter ALT-C to terminate the program and return to CP/M-86; then enter ALT-C again to reset the disk system. Or press the Return key to ignore the error.

Cannot COPY double-sided diskettes

DCOPY error: The computer being used does not have double-sided disk drives. Try again with a single-sided diskette.

Cannot FORMAT double-sided diskettes

FORMAT error: The computer being used does not have double-sided disk drives. Try again with a single-sided diskette.

CANNOT FORMAT TRACK

FORMAT error: You possibly have a bad diskette. Run FORMAT again. If the error persists, discard the diskette.

CANNOT OPEN FILE

BOOTCOPY error: BOOTCOPY could not open the input file. Make sure that the file exists and that you spelled the filename correctly.

CANNOT READ: devicename or filename

PIP error: The source specified in the PIP command is illegal. An output device has probably been specified as a source.

CANNOT READ TRACK

DCOPY error: You possibly have a bad diskette. Run the program again. If the error persists, discard the diskette.

CANNOT SIZE TRACK

DCOPY or FORMAT error: You possibly have a bad diskette. Run the program again. If the error persists, discard the diskette.

CANNOT WRITE: devicename

PIP error: The destination specified in the PIP command is illegal. An input device has probably been specified as a destination.

Can't delete primary boot volume

HDSETUP error: You tried to delete the primary boot volume. Return to command mode, type the A command (assign drives), and choose a nonprimary boot volume. After reassigning drives, delete the desired volume.

CLOSE DRIVE DOOR

SDCOPY error: Drive door open during attempted read or write of sector.

COMMANDNAME?

CP/M-86 error: If CP/M-86 cannot find the command you specified, it returns the command name you entered followed by a question mark. Check that you have typed the command name correctly, or that the command you requested exists as a .CMD file on the default or specified disk.

Controller error

HDSETUP error: Probably a hardware error. Try reloading the operating system.

Copy aborted at track nn

DCOPY error: The diskette has a bad track, and the program is unable to continue. Run the program again, or try moving to another drive. If the error persists, discard the diskette.

DESTINATION IS R/O, DELETE (Y/N)?

PIP error: The destination file specified in a PIP command already exists and it is read/only. If you type Y, the destination file is deleted before the file copy is done.

Directory error-file: filename

CHKDSK error: No valid data blocks are allocated to the named file. CHKDSK deletes the file.

Disk not initialized

CHKDSK error: No directory or file allocation table was found. If files exist on the disk, and the disk has been physically harmed, it may still be possible to transfer files from this disk to recover data.

DISK READ ERROR: filespecifier

PIP error: The input disk file specified in a PIP command could not be read properly. This is usually the result of an unexpected end of file. Correct the problem in your file.

DISK WRITE ERROR: filespecifier

PIP error: A disk write operation could not be successfully performed during a PIP command, probably due to a full disk. You should either erase some unnecessary files or get another disk with more space and execute PIP again.

Diskette archived under incompatible Archive version <X>. You must restore under version <X> or higher.

ARCHIVE error: Program terminates. Redo the restore using a correct ARCHIVE version.

Diskette full. Can not write filename. Reformat this diskette using FORMAT not DELETE *.* and CHKDSK. Also check that you are using double-sided diskettes if you specified double in your command line.

ARCHIVE error: Reformat this diskette using FORMAT.

Diskette is not a completed archive diskette.

ARCHIVE error: The ARCHIVE prompt is repeated. Insert a completed archive diskette.

Divide by Zero

Calculation error: You have tried to divide a number by zero. Type two shifted Calcs to abandon the calculation.

DOUBLE-SIDED DISK CANNOT BE COPIED ON SINGLE-SIDED DRIVE.

SDCOPY error: Response to user's attempt to copy double-sided diskette on a single-sided disk drive.

DOUBLE-SIDED SOURCE DISK CANNOT BE COPIED TO SINGLE-SIDED DESTINATION.

SDCOPY error: Response to user's attempt to copy double-sided diskette to single-sided diskette. Utility will again prompt user to insert a destination diskette. User should replace destination diskette with a double-sided one.

Drive not available for CP/M reading

RDCPM error: You gave an invalid drive specifier with the CP/M file name. Retype the command with a valid drive specifier.

Drive <X> is not a double-sided drive as required by your Archive Disk Library. Redo with a double-sided floppy drive.

ARCHIVE error: Program terminates. Restart using a double-sided diskette.

Drive 0 not initialized

HDSETUP error: Return to command mode, type the I command (initialize), and initialize drive 0.

DRIVE DOOR OPENED

DCOPY or FORMAT error: Close the drive door and restart the program.

Drive =nn, Track =nn, Sector =nn: Error =nn

Bdos Err on X: Bad Sector

CP/M-86 error: This message indicates a hardware problem or a worn, improperly formatted, or missing diskette. Error code numbers are described in Table 16-1.

Press Return. If the message appears again, type an ALT-C to terminate the program and return to CP/M-86; then type another ALT-C. If the error persists, try again with another diskette.

ERROR: BAD PARAMETER

PIP. An illegal parameter has been entered in a PIP command. Retype the entry correctly.

ERROR: CLOSE FILE filespecifier

PIP. An output file cannot be closed. Take appropriate action after checking to see if the correct disk is in the drive and that the disk is not write-protected.

ERROR: DISK READ filespecifier

PIP. The input disk file specified in a PIP command could not be read properly. This is usually the result of an unexpected end of file. Correct the problem in your file.

ERROR: DISK WRITE filespecifier

PIP. A disk write operation could not be successfully performed due to a full disk. You should either erase some unnecessary files or get another disk with more space and execute PIP again.

Error: File list does not exist on requested volume.

ARCHIVE error: Check that your file list file is on the volume specified in your command line.

ERROR: FILE NOT FOUND filespecifier

PIP. Input file specified does not exist.

ERROR: HEX RECORD CHECKSUM filespecifier

PIP. A hex record checksum was encountered during the transfer of a hex file. The hex file with the checksum error should be corrected, probably by recreating the hex file.

ERROR: INVALID DESTINATION

PIP. The destination specified in your PIP command is illegal. You have probably specified an input device as a destination.

ERROR: INVALID FORMAT

PIP. The format of your PIP command is illegal. See the description of the PIP command.

ERROR: INVALID HEX DIGIT filespecifier

PIP. An invalid hex digit has been encountered while reading a hex file. The hex file with the invalid hex digit should be corrected, probably by recreating the hex file.

ERROR: INVALID SEPARATOR

PIP. You have used an invalid character for a separator between two input filenames.

ERROR: INVALID SOURCE

PIP. The source specified in your PIP command is illegal. You have probably specified an output device as a source.

ERROR: INVALID USER NUMBER

PIP. You have specified a User Number greater than 15. User Numbers are in the range 0-15.

ERROR: NO DIRECTORY SPACE filespecifier

PIP. There is not enough directory space for the output file. You should either erase some unnecessary files or get another disk with more directory space and execute PIP again.

ERROR: QUIT NOT FOUND

PIP. The string argument to a Q parameter was not found in your input file. See if you have upper case/lower case conflicts.

Error reading CP/M disk

RDCPM error: A disk error occurred while trying to read the CP/M file. Try to run the program again.

Error reading CP/M disk label

RDCPM error: The disk label on the CP/M diskette cannot be read. The CP/M diskette is probably unformatted or bad.

ERROR: START NOT FOUND

PIP. The string argument to an S parameter could not be found in the source file.

ERROR: UNEXPECTED END OF HEX FILE filespecifier

PIP. An end of file was encountered prior to a termination hex record. The hex file without a termination record should be corrected, probably by recreating the hex file.

ERROR: USER ABORTED filespecifier

PIP. The user has aborted a PIP operation by pressing a key.

ERROR: VERIFY filespecifier

PIP. When copying with the V option, PIP found a difference when rereading the data just written and comparing it to the data in its memory buffer. Usually this indicates a bad copy on the destination disk or drive.

ERROR WHILE READING ON DRIVE drivename

Abort,Ignore,Retry:

MS-DOS error: Type A (for abort), I (for ignore), or R (for retry). Retry the operation before terminating (aborting) the program. In general, you should not ignore the error.

ERROR WHILE WRITING ON DRIVE drivename

Abort,Ignore,Retry:

MS-DOS error: Type A (for abort), I (for ignore), or R (for retry). Retry the operation before terminating (aborting) the program. In general, you should not ignore the error.

FILE ALLOCATION TABLE BAD FOR DRIVE drivename

MS-DOS error: Check that the diskette is formatted. (The message indicates that the copy in memory of one of the allocation tables has pointers to nonexistent blocks.)

FILE EXISTS

CP/M-86 error: CP/M-86 has been asked to create a new file using a file specification that is already assigned to another file. Either delete the existing file or use another file specifier.

File name not found

ARCHIVE error: Program continues; missing filename is reported.

File not found

MS-DOS or CP/M-86 error: The file you specified does not exist. Check that you specified the file correctly and try again.

FILE READ ERROR

BOOTCOPY error: BOOTCOPY could not read the input file. The file is probably corrupt. Try to re-create the file.

File size error for file filename

CHKDSK error: The size of the file in its directory differs from its actual size. The size in the directory is automatically adjusted to indicate its actual size on the disk. (The amount of useful data may be less than the size shown because the last data block may not be used fully.)

<filename> already exists on volume <X>.

Restore anyway? (y/n)

ARCHIVE error: Type Y to continue the restore or N to skip the file and go to the next file in the restore library.

Files cross-linked: filename and filename

CHKDSK error: The same data block is allocated to both files. CHKDSK does not try to correct this. To correct the problem, first use the COPY command to make copies of both files; then delete the originals. Review each file for validity and edit as necessary.

Format aborted at track nn

FORMAT error: The diskette has a bad track, and the program is unable to continue. Run the program again, or try moving to another drive. If the error persists, discard the diskette.

Format failure

FORMAT error: The format was unsuccessful. This message occurs only with one of the other FORMAT error messages.

Hard disk full; <filename> cannot be written.

ARCHIVE error: Start over using a hard disk volume with more space. Program terminates.

Improper date syntax. The correct syntax is month/day/year. (mm/dd/yr where yr is the short year form, e.g. "82", not "1982")

ARCHIVE error: Program terminates. Try again using correct syntax.

Improper response.

ARCHIVE error: The ARCHIVE prompt is repeated. Respond to the prompt correctly.

Improper syntax for an archive name. Archive names have the same form as file names.

ARCHIVE error: Program terminates. Try again using correct syntax.

Improper syntax for a file name.

ARCHIVE error: Program terminates. Try again using correct syntax.

Incomplete command line. Expected to find <key word>.

ARCHIVE error: Program terminates. Retype the command line correctly.

Inserted diskette is not an archive diskette.

ARCHIVE error: Program terminates. You must restart the archive.

Inserted diskette is not [diskette <N>] of Archive Library <XXXXXX>.

ARCHIVE error: The ARCHIVE prompt is repeated. Insert the correct diskette.

Inserted diskette is not newly formatted.

ARCHIVE error: The ARCHIVE prompt is repeated. Insert a newly formatted diskette.

Insufficient disk space

HDSETUP error: List the volumes and look at the free volumes to see how large a new volume can be. Reconfigure with an appropriate capacity.

Insufficient disk space

RDCPM error: There is not enough room on the MS-DOS diskette to transfer the CP/M file. Use a different MS-DOS diskette with more available space.

Invalid Assignment

STAT. An invalid device was specified in a STAT device assignment. Use the STAT VAL: display to list the valid assignments for each of the four logical STAT devices: CON:, AXI:, AXO:, and LST:.

Invalid CP/M disk type

RDCPM error: The diskette that is being read from is not a CP/M diskette. Try again with a CP/M diskette.

Invalid date

MS-DOS error: You typed the date incorrectly. Retype the date correctly. Use numbers only; separate the numbers with hyphens (-) for European format (day-month-year) or slashes (/) for American format (month/day/year).

Invalid Disk Assignment

STAT error: An invalid STAT drive command was given. The only valid drive assignment in STAT is STAT d:=R/O.

Invalid drive specification

FORMAT error: An invalid drive was specified with the command. Retype the command with the correct drive specifier.

Invalid drive specification

MS-DOS error: You specified an invalid drive. Retype the command.

Invalid File Indicator

STAT error: This message results from an invalid command to set file attributes. These are the only options valid in a STAT filespecifier [option] command: \$r/o, \$r/w, \$sys, \$dir.

INVALID FORMAT: invalidentry

PIP error: The format of your PIP command is illegal. See the description of the PIP command.

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Invalid parameter

FORMAT error: An invalid command switch was specified with the FORMAT command. Retype the command with valid switches.

Invalid time

MS-DOS error: You typed the time incorrectly. Retype the time correctly. Separate the numbers with colons (:). Do not type the time for the half second.

nnnnnn bytes of disk space freed

CHKDSK error: Disk space shown as allocated was not actually allocated and has been freed.

NO BOOT SECTORS ON SOURCE DISK

BOOTCOPY error: The source disk does not have boot tracks. Therefore there is no operating system to copy. Use a source diskette with boot tracks.

No boot volume found

HDSETUP error: Return to command mode, type the A command (assign drives), and assign the boot volume to an existing volume. For reference, list the volumes on drive 0 to check the volume names.

NO DISKETTE OR BAD TRACK

FORMAT error: If you have not inserted a diskette in the drive to be formatted, do so and restart the program. If the drive contains a diskette, take it out and retry with another diskette.

Use: [rw] [ro] [sys] or [dir]

STAT. This message results from an invalid set file attributes command. These are the only options valid in a STAT filespec [option] command.

Use: STAT d:=RO

STAT. An invalid STAT drive command was given. The only valid drive assignment in STAT is STAT d:=RO.

NO FILE: = filespecifier

PIP error: Input file specified does not exist.

No room in directory to create files

RDCPM error: The directory on the MS-DOS diskette is full. Use a different MS-DOS diskette with fewer files.

NOT A SYSTEM IMAGE

BOOTCOPY error: The boot tracks on the source disk do not contain an operating system. Use a system disk.

NOT ENOUGH MEMORY

BOOTCOPY error: There is not enough memory in the system to do the BOOTCOPY. Boot up a smaller operating system and then run BOOTCOPY or try to build a smaller system.

Open <filename>, cannot be closed.

ARCHIVE error: Check that current diskette is correct. Press Return when ready (Q for emergency exit).

Operating system version mismatch

FORMAT error: The operating system being used is not compatible with the version of FORMAT being used. Use the correct version of the program or load the correct operating system.

Overflow

Calculator error: Your calculation is longer than 14 digits. Type two shifted Calcs to abandon the calculation.

QUIT NOT FOUND: = source

PIP error: The string argument to a Q parameter was not found in your input file.

Read error: D=nn, T=nn, S=nn, E=nn

CANNOT READ TRACK

DCOPY or FORMAT error: Retry the program; discard the diskette if the error persists. (D stands for drive, T stands for track, S stands for sector, and E stands for error code. Error codes are described in Table 16-1.)

Sector write error: D=nn, T=nn, S=nn, E=nn
CANNOT WRITE DISK LABEL

DCOPY or FORMAT error: The program is unable to write the disk label to the diskette. The drive, track, sector, and error code numbers are indicated. Error codes are described in Table 16-1.

Soft format error: D=nn, T=nn, S=nn, E=nn

FORMAT error: A soft format error has occurred. The drive, track, sector, and error code numbers are indicated. Error codes are described in Table 16-1.

If there are more than 9 soft errors on a track, the program aborts. Soft errors in moderate numbers are not harmful to diskette performance.

Source and destination drives must not be the same

RDCPM error: The CP/M file cannot be moved onto the same diskette in MS-DOS format. Specify separate drives in the command.

Source file name missing

RDCPM error: You typed the RDCPM command without a CP/M file specifier. Retype the command with a CP/M file specifier.

Source file not found

RDCPM error: The CP/M file name given cannot be found on the CP/M diskette. Retype the command with the correct file name or insert the correct CP/M diskette.

START NOT FOUND: = source

PIP error: The string argument to an S parameter could not be found in the source file.

System error: Segment wrap around on system read. Program exit is necessary. Suggested recovery : split your current Archive Library into two sections and archive each section separately.

ARCHIVE error: Program terminates. Recover as suggested.

Temporary restore file not found, must redo from start.

ARCHIVE error: Program terminates. Redo the restore.

Too Many Files

STAT. A STAT wildcard command matched more files in the directory than STAT can sort. STAT can sort a maximum of 512 files.

VERIFY ERROR: filespecifier

PIP error: When copying with the V option, PIP found a difference when rereading the data just written and comparing it to the data in its memory buffer. Usually this indicates a bad copy on the destination disk or drive.

VOLUME IN DRIVE IS NONEXISTENT OR IS NOT A FLOPPY.

SDCOPY error: User is either attempting to use a volume on a hard disk drive, or there is no floppy in the disk drive.

Volume <X> is available but is empty.

ARCHIVE error: Program terminates. Try again with the correct volume.

Volume <X> not available.

ARCHIVE error: Program terminates. Try again with the correct volume.

WARNING – DOUBLE-SIDED DESTINATION DISK WILL BECOME SINGLE-SIDED AS A RESULT OF THIS OPERATION. DO YOU WISH TO CONTINUE? (y/n)

SDCOPY error: Response to user's attempt to copy single-sided diskette to double-sided diskette. Type "y" for yes or "n" for no.

WRITE ERROR: Drive=xx, Track=xx, Sector=xx, Error=xx

BOOTCOPY error: There was a write error on the given track and sector. Try to run the program again to see if the same error occurs.

WRONG DESTINATION DISK LABEL TYPE

BOOTCOPY error: The destination disk has an incorrect software label. Format the disk with the correct version of FORMAT; any files on the disk will be lost.

WRITE PROTECTED DISKETTE

FORMAT error: The diskette being formatted has a write-protect label on it. Remove the label and try again. Files already existing on the diskette may be erased if you do this.

WRONG DESTINATION DISK

SDCOPY error: Current destination diskette is different from original one. Applies to situation involving multiple insertions of destination diskette.

WRONG SOURCE DISK

SDCOPY error: Current source diskette is different from original one. Applies to situation involving multiple insertions of source diskette.

<X> is not an available floppy drive.

ARCHIVE error: Program terminates. Try again with an available floppy drive.

16.2 ERROR CODES

Several MS-DOS and CP/M-86 error messages contain 2-digit error codes. There are five general types of error codes:

1x—Cannot find sector

2x—Cannot read sector

3x—Sector verify error

4x—Formatting error

Fx—Miscellaneous

Table 16-1 defines the error codes.

Table 16-1: Error Codes

ERROR CODE NUMBER	DEFINITION
COULD NOT COMPLETE READ-RELATED COMMAND	
11	Noise encountered on sync line
12	Bad header block ID
13	Checksum error in header
14	Header GCR error
15	Wrong track
16	Wrong sector
17	Bad job code
INVALID DATA ON DISKETTE	
21	Bad data block ID
22	Checksum error in data
23	GCR error
24	Sync time out
DEFECTIVE DRIVE OR DISKETTE	
31	Bad data block ID
32	Verify error
33	Checksum error
34	GCR error
FORMAT PROGRAM ERROR CODES	
41	No sync found (bad or missing diskette)
42	Bad header ID
43	Wrong track
44	Wrong sector
45	Bad header checksum

Table 16-1: Error Codes continued

ERROR CODE NUMBER	DEFINITION
46	Gap error
47	GCR error
48	No data sync
49	Bad data ID
4A	Data verify error
4B	Data checksum
4C	Gap 2 error
4D	GCR error
MISCELLANEOUS	
F1	Cannot address second side of diskette
F2	Step error—cannot find track
F3	Data not written due to disk change
F4	Cannot write to disk until logged (^C)
F5	Wrong diskette type
F6	Cannot start disk operation
F7	Illegal track number
F8	Illegal drive number
F9	Illegal disk operation
FA	Door open
FB	Drive motor not up to speed
FC	Write-protected diskette
FD	Bad track on diskette
FE	Cannot complete disk operation
FF	Bad diskette or unformatted diskette

Appendix A

HARD DISK OPERATIONS

INTRODUCTION

A.1

The hard disk allows you to store much more information and operate more quickly with your computer. The hard disk storage capacity is 10.6 million bytes (Mbytes) of formatted data. A byte is equivalent to one character, such as a letter or number.

Configuration

A.1.1

You can use the hard disk setup utility to configure (define) the operating environment to suit your needs.

You can divide the hard disk into several "virtual volumes", each of which acts as a separate storage area. Each virtual volume can be assigned one of the drive letters used by the operating system. The operating system uses the drive letter to identify the virtual volume.

You can store various operating systems on the hard disk—and set up the hard disk to use the operating system you need.

You can also easily reconfigure the hard disk when necessary. Easy reconfiguration provides great flexibility—and allows you to run all your floppy-disk-based software on the hard disk.

Backup Utility

A.1.2

The hard disk archive utility allows you to back up and restore your work. (Virtual volumes are archived separately.) You can back up or restore your files in groups or individually, and you can use the date as a qualifier for storing file groups.

A.1.3 Hardware Components

The hard disk subsystem includes the 5 1/4 inch hard disk, an intelligent disk controller, and a power supply. Multiple hard disks with multiple volumes per disk are also supported.

The hard disk is available in two configurations: one with an internal hard disk and one with an external hard disk. Systems with an internal hard disk have only one floppy disk drive (drive B).

A.2 GENERAL OPERATION

This section briefly describes how to get started using a hard disk system. Refer to Chapters 1 through 6 for more information on using the computer. Refer to Chapters 7 through 9 for more information on using the MS-DOS operating system.

A.2.1 How To Turn On the Power

Turn on the power for an internal hard disk system in the same way that you turn on the power for a system without a hard disk:

1. Check that the floppy disk drive does not contain a diskette.
2. Press the power switch (the rocker switch on the left rear of the processor unit) to on (the "1" position).

The hard disk takes several seconds to come up to speed. Leave the power on except during extended periods of nonuse.

For an external hard disk system, turn on the power for the main system as described above. Use the power switch on the rear panel of the hard disk to turn on the power for the hard disk. An external system should also be left powered on except during extended periods of nonuse.

How To Load the Operating System

A.2.2

You can load the operating system either from a floppy diskette or from the hard disk. To load the operating system from the hard disk, you must first configure the hard disk with the setup utility (described in A.3).

A configured hard disk that contains the operating system automatically loads the operating system when you turn on the power.

For a hard disk that does not contain the operating system, load the system by inserting an operating system floppy diskette. Insert the diskette in either drive for an external hard disk system. Insert the diskette in the right drive for an internal hard disk system. You may then configure the hard disk. A.5.4 describes how to copy an operating system from a floppy diskette onto the hard disk.

When the operating system is loaded, it displays its sign-on banner and prompts you for the time and date. Type in the time and date, separating the numbers with colons. Remember that the operating system keeps a 24 hour clock: 11 pm is 23:00.

How To Back Up Files

A.2.3

It is very important to keep extra copies of your files on floppy diskettes. Otherwise, you will have to recreate the contents of a file if it is accidentally destroyed.

Use the archive utility (described in A.4) to create backup copies of your hard disk files. Backup files may be restored to replace lost files or to review or modify the information they contain.

A

How To Organize Data

A.2.4

The key to efficient use of the hard disk is knowing how to organize your data. For example—

- You can divide the system into a number of "floppies" so that each person using the hard disk would "own a floppy."
- You can store all your system files and application programs on one virtual volume, leaving the other volumes for data storage. This may be useful if you update your files often and wish to backup all your files regularly.
- If you generally run one major program (such as an accounting program), you can dedicate one volume (occupying most of the hard disk) to this application's data storage.

A.3 HARD DISK SETUP UTILITY

A.3.1 Introduction

The setup utility allows you to configure the hard disk. Hard disk configuration defines the operating environment for the hard disk.

The hard disk has a large storage capacity. You can use the setup utility to divide this storage into separate sections. Otherwise, the number of entries in your file directory may grow too large for convenient handling, and the system may not store files efficiently. (Efficient file storage is discussed in A.3.2.)

The separate storage sections are called virtual volumes. Each virtual volume appears to the operating system as an individual volume. You can use the setup utility to create and delete virtual volumes.

You also use the setup utility to name the virtual volumes. Volume names are used during hard disk configuration and for your convenience in keeping track of volume use. The operating system does not use the volume names.

Once you have divided the hard disk storage into virtual volumes, you assign “drive letters” to the volumes. At the same time, you assign drive letters to the floppy drive or drives on your unit. You may assign any of the available drive letters to a floppy drive. If your hard disk is external, you may follow convention by assigning the letter B to the right drive and the letter A to the left drive. If your hard disk is internal (replacing the left floppy drive) you may assign either A or B to the right drive—or, you may assign an entirely new letter to the floppy drive.

Always assign at least one floppy drive to a drive letter. The operating system uses the drive letters to reference the separate storage volumes and the floppy drives.

The drive assignments are recorded on a volume that you designate as the “primary boot” volume. Designation of the primary boot volume is part of the drive assignment process.

To use the virtual volumes you have created, you must reload (boot) the operating system. Every time you modify a virtual volume, you must reboot to use it. Using a reconfigured virtual volume without rebooting may cause unpredictable problems.

ALWAYS REBOOT BEFORE USING A RECONFIGURED HARD DISK SYSTEM.

User Interface

A.3.2

Load the setup utility by typing HDSETUP immediately after the operating system has loaded. The utility prompts you for commands and information.

A

When you have configured the hard disk and exited from the setup utility, press the reset button (the square button on the lower right rear of the processor unit). This reloads the operating system and allows you to use the new system configuration.

Commands

The utility first prompts you for a command. The format of the prompt is:

Please enter a command.

The utility also displays a list of the commands you can enter:

- I Initialize a hard disk drive.
- C Configure a new virtual volume.
- A Assign drive letters to volumes.
- D Delete an existing virtual volume.
- L List volumes or drive assignments.
- Q Quit and exit the program.

All of these commands, except Q, prompt you for additional information. For several of the commands, you can choose default values. A default value is a standard value that the computer sets for you.

Below is a detailed description of each command and how to use it—including how to choose the default value.

I—INITIALIZE A HARD DISK DRIVE

Use the I command in two situations: (1) when a hard disk is first added to your system, or (2) when you wish to reconfigure an entire disk, and ALL files have been backed up.

The I command prompts you to verify that you want to use it:

THIS OPERATION WILL DESTROY THE DISK CONTENTS

Do you still want to do this? (Y/N)

If you respond “N”, you are asked to type Return. You are then returned to command mode (i.e., it displays the command list described above).

If you respond "Y", the second prompt is for the number of the disk to be formatted. It prompts you with the question:

What is the number of the hard disk to be initialized?

If you have one hard disk, type Return, which gives the default value of 0.

If you have more than one hard disk on your computer (a daisy chain), enter the number of the hard disk in the chain. The number of the first hard disk is 0.

If you do not know the number of your hard disk, ask the person in your office responsible for maintaining your computer.

After the disk is initialized, you are asked to type Return. You are then returned to command mode.

C—CONFIGURE A NEW VIRTUAL VOLUME

The C command allows you to create virtual volumes on the hard disk. When configuring a new volume, you are prompted to enter a series of volume attributes.

Choose the default value by pressing Return in response to the prompt. The default value for each of the attributes described below is displayed along with the prompt.

After you have configured a volume, the computer returns you to command mode.

The attribute prompts are described here:

- The first attribute is the number of the hard disk. The prompt is:

Which disk number is to be configured?

(Remember, the first hard disk in a chain is number 0.)

- The second attribute is the volume name. This name is limited to sixteen (16) printable characters. Type any name you want to identify the volume. The prompt is:

What is the volume name?

- The third attribute is the capacity of the volume. This number must be entered in Kbytes. One Kbyte is 1024 bytes or characters; the total hard disk capacity is 10 thousand Kbytes. The prompt is:

What is the capacity, in Kbytes?

- The fourth attribute is the size of the allocation unit of the volume. This is also entered in Kbytes. The prompt is:

What is the allocation unit?

Allocation units (AUs) are the building blocks for files stored on the hard disk. You choose the size of AUs for each volume. AUs can be the following sizes: 1K, 2K, 4K, and increasing multiples of two up to 64K. Any file that you create is broken up and stored in AU blocks. The size of the blocks is determined by the size of the AUs you select when configuring a volume.

Efficient use of disk space depends on selecting optimum sizes for AUs. Also, the amount of workspace memory available to you is affected by AU size. A table stored in memory lists the locations on the hard disk of each file's AUs. If the AU size is small and the capacity of the volume is large, this table is large and occupies more memory space.

To determine the AU size for a virtual volume, consider your average file size and the volume's capacity. If a volume is to replace a floppy disk containing interdepartmental memos, the typical size file might be 1K to 3K. Selecting an AU of 1K and a volume capacity similar to that of the floppy would be appropriate. If you select an AU of 4K, every document would require a minimum of 4K of space on the disk.

As another example, consider an accounting program that stores files 20K to 30K. If you selected 16K AUs, a 23K file would require two AUs: 32K would be used to store 23K. This is a waste of disk space. If you selected 2K AUs, 12 AUs would be used. Eleven of these would be fully used; the 12th would be half full. Only 1K of disk space would be wasted.

However, when the size of the AUs is small, the number of total AUs used is large. Remember that the table stored in memory increases in size as the size of the AUs decreases.

- The fifth attribute is the number of file directory entries for the hard disk. This is the number of files you want to store on the hard disk. The prompt is:

How many directory entries?

The volume is now configured. After finishing, the utility asks you to type Return to continue.

A—ASSIGN DRIVE LETTERS TO VOLUMES

After configuring volumes, use the A command to assign drives for the next system boot.

The first prompt is for a primary boot volume. This is a volume on hard disk 0 that informs the operating system of the drive assignments for the next system boot. This prompt is:

What is the name of the primary boot volume?

In response, type the name of a volume you have configured. The utility then prompts you to enter the disk numbers and volume names for the various drives. The first prompt is:

**Drive Letter:
Disk number =**

A default disk number is displayed and can be selected by pressing Return. A different number may be entered, followed by a Return. The next prompt is:

Volume Name =

A volume name must be entered, followed by a Return.

To assign a floppy to a drive, enter the floppy number (0 for left, 1 for right) in response to the disk number prompt. Enter the word "floppy" for the volume name prompt.

After you have assigned drives to all the volumes you want, type Return in response to the disk number prompt and Period, followed by Return, in response to the volume name prompt.

After making drive assignments, you are asked to type a Return. You are then returned to command mode.

D—DELETE AN EXISTING VIRTUAL VOLUME

Delete a volume only after you have backed up the files in the volume. The utility prompts you to enter the disk number and name of the virtual volume to be deleted. Enter the number and name as described in "A—Assign Drives To Volumes."

Deleting a volume causes all data on the volume to be lost, so the utility prompts you to verify the deletion. If you enter "Y" for yes, the virtual volume is deleted and you are asked to type Return to go back to command mode. If you enter "N" for no, a Return must be typed to return to command mode.

L—LIST VOLUMES OR DRIVE ASSIGNMENTS

When you enter this command, the utility prompts you for the type of list desired. Enter "V" for volumes or "A" for assignments. You are prompted for a disk number if you request a volume list. The volume attributes are displayed in the following format:

DISK NAME TYPE AU DIR. ENT

where disk is the disk number, name is the volume name, type is the operating system, AU is the number of AUs, and dir. ent is the number of directory entries.

The format for the list of drives is:

DRIVE LETTER : DISK NUMBER VOLUME NAME

After the list is displayed, a Return must be typed to return to command mode.

Q—RETURN TO THE OPERATING SYSTEM

When you have configured a new system, type Q to return to the current operating system.

TO USE THE NEWLY CONFIGURED SYSTEM, RELOAD BY PUSHING THE RESET BUTTON.

Messages

A.3.3

Following are the messages you may encounter while using the hard disk:

► **Controller error**

Probably a hardware error. Try reloading the operating system.

► **Bad volume name**

Specify a new volume name. List the volumes to check that you have the right name and redo the operation that caused the error.

► **Can't delete primary boot volume**

You tried to delete the primary boot volume. Return to command mode, type the A command (assign drives), and choose a different primary boot volume. After reassigning drives, delete the desired volume.

► **Insufficient disk space**

List the volumes and look at the free volumes to see how large a new volume can be. Reconfigure with an appropriate capacity.

► **No boot volume found**

Return to command mode, type the A command (assign drives), and assign the boot volume to an existing volume. For reference, list the volumes on drive 0 to check the volume names.

► **Bad boot volume**

See "No boot volume found."

► **Drive 0 not initialized**

Return to command mode, type the I command (initialize), and initialize drive 0.

► **Allocation unit is too small**

Return to command mode, type the C command, and reenter all attributes, including a larger allocation unit. Be sure to choose one of the allocation unit options displayed with the command.

► **Assignments are in default order**

Drive assignments have not been made. Return to command mode, type the A command (assign), and make drive assignments.

A.4 ARCHIVE FILE UTILITY

A.4.1 Introduction

The ARCHIVE utility saves and restores files on the hard disk. Files can be saved and restored singly or in groups. Saved files are written to one or more diskettes, depending on the number and size of the files. Large files can be split across several diskettes. Restored files are read from diskette to a designated hard disk volume.

File groups are saved or restored in wild-card groups or by argument file. An argument file is a file that contains a line. You can specify that only files updated since a certain date be archived. Up to 1000 files can be archived in a run.

Archive Commands

A.4.2

The two ARCHIVE commands are ARCHIVE and RESTORE. With either command, the utility prompts you through each step of the process.

The ARCHIVE command writes the files you specify on diskette(s). These diskettes are called the Archive Diskette Library. Each diskette contains an Archive Directory that records the files contained on your diskette(s).

The RESTORE command writes the files in the Archive Diskette Library back to a hard disk volume. During a RESTORE, you are prompted to insert specific diskettes from the Archive Diskette Library.

You can quit the utility at any point by typing **Q<cr>**. If you quit during the middle of an ARCHIVE or RESTORE command (after having completed at least one diskette), you can restart where you left off by re-entering the command line, as described in the next part.

A description of the command syntax for each ARCHIVE command follows. The command syntax shows how you can type the command. The syntax shows keywords—which must be typed exactly as shown—and parameters—which are values that you specify. In the syntax descriptions, keywords are shown in uppercase, and parameters are shown in lowercase. However, you may type in upper- or lowercase. Keywords and parameters that are optional are enclosed in brackets.

Archive Command Line Syntax

```
ARCHIVE [&]<filelist> [SINCE <date>]  
[UNDER <archivename>] FROM <winchestervol>  
TO <diskettedrive> [DOUBLE]
```

Where:

&	Is optional; indicates that <filelist> is an argument file name. The argument file name must include the volume name, file name, and file extension. The argument file name cannot include wild-cards.
filelist	Is a file identifier with or without wild-cards.
date	Is optional; specifies that files modified since this date are to be archived. Format is mm/dd/yy. (The default date is 1/1/80.)
archivename	Is optional; specifies the name assigned to the archive library. (The default is the current date plus the extension .arc: i.e., 10/5/82.arc.)
winchestervol	Is the letter name (A– P) of the hard disk virtual volume from which the files are to be archived.
diskettedrive	Is the letter name (A– P) of the floppy disk drive to be used.
double	Is optional; specifies that double-sided diskettes are used. (The default specifies single-sided diskettes.)

Restore Command Line Syntax

```
RESTORE [&]<filelist> FROM <diskettedrive>  
TO <winchestervol>
```

The command parameters are the same as for ARCHIVE, except that diskette drive becomes the subject and the winchestervol becomes the target.

Restart Command Line Syntax

You can restart an interrupted ARCHIVE or RESTORE run with the following command syntax (you need not respecify the command parameters):

ARCHIVE TO <diskette>

— or —

RESTORE [FROM <diskette>] TO <winchestervol>

Command Examples

A.4.3

archive *.* since 9/1/82 under sept.arc from k to b double

The above command would archive all files modified since September 1, 1982 (*.* since 9/1/82) from hard disk volume K (from k). The library would be named sept.arc (under sept.arc), and the archived files would be written to double-sided diskette(s) in floppy disk drive B (to b double).

archive &k:file.lst from k to a

The above command line uses default values. The & indicates that the file specifier is a full argument file name that does not contain wild cards (&k:file.lst). The file K:FILE.LST contains the archive directory. Files on volume K (from k) are to be written to single-sided diskette(s) in floppy disk drive A. The archive library name would (by default) be the current date with the extension ARC. All files modified since 1/1/80 (the default date) would be archived.

archive to b

The above command line would restart an archive that has been interrupted (possibly to format additional diskettes). The archive is to be continued on drive B.

You must archive at least one diskette on the original archive run to be able to restart the archive after an interruption. Restart an archive on the original drive—or on an available drive that can handle the capacities of the original archive.

A.4.4 Command Sample Runs

A command run is what happens while the command does its work. The following command run examples show what is displayed on the screen after you type an ARCHIVE command. In the examples, what you would type is gray.

Archive Sample Run

```
archive *.* since 10/01/82 under oct.arc from  
c to d ↵
```

Archive
Version 1.0

Archiving files modified since 10/01/82 under oct.arc on
single sided diskettes.

Insert a newly formatted diskette in drive d. Press return
when ready. (Q to quit program) ↵

Writing:

Diskette 1 of 15.

Writing to diskette 1 complete.

Now

1) Remove diskette 1.

2) Label it:

oct.arc

Diskette 1 of 15

10/05/82

3) AFFIX A WRITE PROTECT TAG TO THE DISKETTE

You will need 14 additional newly formatted diskettes to archive the rest of the files.

Do you need to format diskettes? (y/n) <y>

[Program exits to operating system.]

Archive Sample Run Description

The command line archives all files on virtual volume C modified or created since the beginning of October. The archive is on single-sided diskettes (the default) on drive D. The Archive Diskette Library is named OCT.ARC.

In the sample the utility has—

1. Created the Archive Directory (an alphabetical list of the files to be archived) and allocated files to the diskettes in the Archive Diskette Library.
2. Transferred the file(s) allocated to diskette 1 onto the first diskette inserted.
3. Written 2 utility files to diskette 1: ARC.DAT and ARC.ALF. ARC.DAT contains the Archive Directory. ARC.ALF contains housekeeping information required by ARCHIVE and RESTORE. These utility files are written to each archive diskette after the diskette is processed.

Diskette 1—which has been fully processed—contains enough information to restart the interrupted archive after more diskettes have been formatted. If you had left the program at the first call for a formatted diskette, the entire command line would have to be retyped to restart the archive.

Archive Restart Sample Run

Archive to d ↵

Archive
Version 1.0

Continuing to d.

Insert the last completed Archive diskette into drive d.
Press return when ready. (Q to quit program) ↵

Archive Library oct.arc
This diskette is number 1 of 15.
This library contains files of volume c
archived on 10/05/82.

Insert a newly formatted diskette into drive d.
Press return when ready. (Q to quit program) ↵

Writing:

Diskette 2 of 15.

Writing to diskette 2 complete.

[This continues until all files are archived.]

Archiving complete.

Archive Restart Sample Run Description

This example continues the archive started in the ARCHIVE sample run.

When you restart an archive, check the archive diskette header to verify you are restarting the right archive. If you have inserted the wrong diskette, exit the program by typing a Q and retype the restart command line.

Restore Sample Run

Restore *.* from b to f ↵

Restore
Version 1.0

Restoring from b to f

Insert a diskette from the archive library into drive b.

Archive Library oct.arc
This diskette is number 7 of 15.
This library contains files of volume c
archived on 10/05/82.

Insert diskette 1 in drive b.
Press return when ready. (Q to quit program) ↵

Archive Library oct.arc
This diskette is number 1 of 15.

Restoring:

filename1

.

.

Restoration of diskette 1 complete.

A

Insert diskette 2 in drive b.

Press return when ready. (Q to quit program) ↵

Archive Library oct.arc

This diskette is number 2 of 15.

[and so on....]

Restoring complete.

[Program exits to operating system.]

Restore Sample Run Description

This is an example of a full restore. Note that you need not type the archive name with the RESTORE command.

Any diskette from the Archive Diskette Library can be used to prime the RESTORE process. The Restore Directory is constructed from the command line and the utility files on the inserted diskette. The Restore Directory is a subset of the Archive Directory.

A copy of the Restore Directory is saved in a temporary file (ARC.\$\$\$) on the target restore volume. This allows an interrupted restore to be restarted. You must prepare a RESTORE volume sufficient to hold the restored files and ARC.\$\$\$ (ARC.\$\$\$ requires 1 to 2 memory allocation units.)

Restore Restart Sample Run

Restore *.* from n to k ↵

Restore

Version 1.0

Restoring from n to k.

Insert a diskette from the archive library into drive n.
Press return when ready. (Q to quit program) ↵

Archive Library total.arc
This diskette is number 7 of 15.
This library contains files of volume c
archived on 9/11/82.

Insert diskette 1 in drive n.
Press return when ready. (Q to quit program) q

[Program exits to the operating system.]

Restore to k ↵

Restore
Version 1.0

Continuing from n to k.

Insert a diskette from the Archive Library oct.arc into
drive n.
Press return when ready. (Q to quit program) ↵

Archive Library oct.arc
This diskette is number 2 of 10.

Insert diskette 1 in drive n.
Press return when ready. (Q to quit program) ↵

Archive Library oct.arc
This diskette is number 1 of 10.

[and so on....]

Restoring complete.

[Program exits to operating system.]

Restore Restart Sample Run Description

In this example, you exit RESTORE after the second diskette has been processed. The restart is on the original floppy disk drive, which avoids the problem of matching the capacities of a new drive and the original drive.

A.4.5 Error Warning Messages

► **Open <filename>, cannot be closed.**

Check that current diskette is correct. Press Return when ready (Q for emergency exit).

► **Hard disk full; <filename> cannot be written.**

Start over using a hard disk volume with more space. Program terminates.

► **Volume <X> not available.**

Program terminates.

► **Volume <X> is available but is empty.**

Program terminates.

► **<X> is not an available floppy drive.**

Program terminates.

► **Improper response.**

Prompt is repeated.

► **Improper syntax for an archive name. Archive names have the same form as file names.**

Program terminates.

► **Improper syntax for a file name.**

Program terminates.

- **Improper date syntax. The correct syntax is month/day/year. (mm/dd/yr where yr is the short year form, e.g. "82", not "1982")**
Program terminates.
- **Temporary restore file not found, must redo from start.**
Program terminates.
- **Inserted diskette is not newly formatted.**
Prompt repeats.
- **Diskette is not a completed archive diskette.**
Prompt repeats.
- **Inserted diskette is not [diskette <N>] of Archive Library <XXXXXX>.**
Prompt repeats.
- **Inserted diskette is not an archive diskette.**
Program terminates.
- **Diskette archived under incompatible Archive version <X>. You must restore under version <X> or higher.**
Program terminates.
- **<filename> already exists on volume <X>. Restore anyway? (y/n)**
- **Drive <X> is not a double sided drive as required by your Archive Disk Library. Redo with a double sided floppy drive.**
Program terminates.

► **Diskette full. Can not write filename.**

Reformat this diskette using FORMAT. Also check that you are using double-sided diskettes if you specified double in your command line.

► **System error: Segment wrap around on system read. Program exit is necessary. Suggested recovery : split your current Archive Library into two sections and archive each section separately.**

Program terminates.

► **Incomplete command line. Expected to find <key word>.**

Program terminates.

► **Archive Library mis-match!! The archive Library last being restored to volume <X> does not match the Archive Library of the inserted diskette.**

► **Error: File list does not exist on requested volume.**

Program terminates.

► **Filename not found.**

Program terminates.

► **Cannot open file.**

Program terminates. Usually this condition occurs during a restart. Recover by starting the entire utility over.

► **Cannot create file**

Program terminates. Usually this condition occurs during a restart. Recover by starting the entire utility over.

FLOPPY DISK UTILITIES, THE SYSCOPY UTILITY, A.5 AND THE COPY COMMAND

Introduction

A.5.1

The operating system utilities FORMAT and DCOPY only work on floppy diskettes. FORMAT prepares a diskette to receive data, and DCOPY copies one floppy diskette onto another. FORMAT uses one or two floppy drives; DCOPY uses two floppy drives.

With an external hard disk, you can use both FORMAT and DCOPY (both floppy drives are available). With an internal hard disk, you can only use FORMAT (only one floppy drive is available).

When you use FORMAT or DCOPY, drive A is always the left floppy drive, and drive B is always the right floppy drive, regardless of drive assignments made during hard disk setup.

The SYSCOPY utility works on floppy diskettes and hard disk virtual volumes. SYSCOPY copies the operating system from a diskette or volume onto another diskette or volume.

You can use the COPY command to copy one floppy diskette onto another. COPY also copies files between virtual volumes and to and from a volume and a diskette.

A.5.2 through A.5.5 describe how to use FORMAT, DCOPY, SYSCOPY, and COPY on a hard disk system. Command syntax uses the conventions described in A.4.2 (i.e., keywords are uppercase, and optional parameters are enclosed in brackets).

The FORMAT Utility

A.5.2

FORMAT prepares diskettes to receive data. In the process, FORMAT automatically erases any previous files on the diskette. New diskettes must be formatted before they can be used.

FORMAT operates only on floppy diskettes.

NOTE: With FORMAT, drive A is always the "left" floppy drive and drive B is the "right" floppy drive, regardless of virtual volume drive reassignments. With an internal hard disk, use drive B only to format diskettes.

Command Syntax

The command syntax for FORMAT is—

FORMAT [<drivename:>][/C][/D][/E][/S][/Z]

where drivename is the name of the drive containing a diskette to be formatted, and /C, /D, /E, /S, and /Z are command "switches". The command switches display information about the format, except for the /S switch. The /S switch is used to create an operating system diskette.

WITH AN INTERNAL HARD DISK SYSTEM, DO NOT GIVE A DRIVE NAME PARAMETER WITH FORMAT. OTHERWISE, YOU WILL DESTROY THE FILES ON YOUR OPERATING SYSTEM DISKETTE.

Command Operation

If you give a drive name with the FORMAT command, FORMAT simply formats the designated diskette and exits to the operating system.

Never give a drive name if your system has an internal hard disk. After FORMAT loads, remove your operating system diskette from drive B and insert the diskette to be formatted.

When you do not give a drive name, FORMAT prompts you—

- To type the name of the drive containing the diskette to be formatted.